WHAT IS CLAIMED IS:

1. A color display device that determines a relationship between plural color components of an input color image signal in terms of gradation levels of the plural color components of an input color image signal, and that carries out calculation based on the relationship for each of the plural color components excluding a component with a relatively smallest gradation level, using variables varying depending on the respective gradation levels of the plural color components.

2. A color display device that determines a relationship between three color components of an input color image signal in terms of gradation levels of the three color components of an input color image signal, and that carries out a different calculation for each input color image signal depending on which of six patterns of the relationship that the input color image signal belongs to, the calculation being performed for each of the three color components excluding a component with a relatively smallest gradation level, using variables varying depending on the respective gradation levels of the three color components.

3. The color display device as set forth in claim 1, wherein:

the variables are determined so that gradation levels of the input color image signal after color compensation fall within a range of a color model that expresses the gradation levels of the input color image signal before and after color compensation in terms of distributions of hue, luminance and saturation.

4. The color display device as set forth in claim 2, wherein:

the input color image signal is converted into an output color image signal with the at least three color components respectively having gradation levels of r', g' and b', which are given by:

$r'=r+ro+yo+mo$,

$g'=g+go+yo+co$,

$b'=b+bo+mo+co$,

where r, g and b are values obtained by dividing original gradation levels of the three color components of the input color image signal by a maximum gradation value N-1; and

in a case [1] where $r \geq g \geq b$:

$ro=Krg(r-g)^{Nr}$,

$yo=Kyg(g-b)^{Ny}$,

go=bo=mo=co=0,

in a case [2] where r≥b>g:

$ro=Krb(r-b)^{Nr}$,

$mo=Kmb(b-g)^{Nm}$,

go=bo=yo=co=0,

in a case [3] where b>r≥g:

$bo=Kbr(b-r)^{Nb}$,

$mo=Kmr(r-g)^{Nm}$,

ro=go=yo=co=0,

in a case [4] where b>g>r:

$bo=Kbg(b-g)^{Nb}$,

$co=Kcg(g-r)^{Nc}$,

ro=go=yo=mo=0,

in a case [5] where g≥b>r:

$go=Kgb(g-b)^{Ng}$,

$co=Kcb(b-r)^{Nc}$,

ro=bo=yo=mo=0,

in a case [6] where g>r≥b:

$go=Kgr(g-r)^{Ng}$,

$yo=Kyr(r-b)^{Ny}$,

ro=bo=mo=co=0,

in which Krg, Krb, Kbr, Kbg, Kgb, Kgr, Kyg, Kyr, Kmb, Kmr, Kcg and Kcb are variables which change depending on values of r, g and b; and Nr, Ng, Nb, Ny, Nm and Nc are constants not less than 0.

5. The color display device as set forth in claim 4, wherein:

the variables are expressed as:

Krg=Cr·frg (r,b), Krb=Cr·frb (r,g),

Kgr=Cg·fgr (g,b), Kgb=Cg·fgb (g,r),

Kbr=Cb·fbr (b,g), Kbg=Cb·fbg (b,r),

Kyg=Cy·fyg (r,b), Kmb=Cm·fmb (r,g),

Kmr=Cm·fmr (b,g), Kcg=Cc·fcg (b,r),

Kcb=Cc·fcb (g,r), Kyr=Cy·fyr (g,b),

where Cr, Cb, Cg, Cy, Cm and Cc are constants; frg, frb, fgr, fgb, fbr, fbg, fyg, fmb, fmr, fcg, fcb and fyr are functions which respectively change depending on values of r, g and b in corresponding brackets; and the r, g and b are obtained by dividing original gradation levels of the three color components of the input color image signal by a maximum gradation value N-1.

6. The color display device as set forth in claim 4, wherein:

the variables are expressed as:

Krg=Cr·far (r)·fag (b), Krb=Cr·far (r)·fab (g),

Kgr=Cg·fag (g)·far (b), Kgb=Cg·fag (g)·fab (r),

Kbr=Cb·fab (b)·far (g), Kbg=Cb·fab (b)·fag (r),

Kyg=Cy·far (r)·fab (b), Kmb=Cm·far (r)·fag (g),

$Kmr=Cm \cdot fab\ (b) \cdot fag\ (g)$, $Kcg=Cc \cdot fab\ (b) \cdot far\ (r)$,

$Kcb=Cc \cdot fag\ (g) \cdot fa\ r(r)$, $Kyr=Cy \cdot fag\ (g) \cdot fab\ (b)$,

where Cr, Cb, Cg, Cy, Cm and Cc are constants; far, fab and fag are functions which respectively change depending on values of r, g and b in corresponding brackets; and the r, g and b are obtained by dividing original gradation levels of the three color components of the input color image signal by a maximum gradation value N-1.

7. The color display device as set forth in claim 6, wherein:

the functions far(r), fab(b) and fag(g) are continuous functions which give 0 when the r, g and b $(0 \le r,g,b \le 1)$ are 0 or 1.

8. The color display device as set forth in claim 4, wherein:

the variables are expressed as:

$Krg=Cr \cdot \alpha r \cdot \alpha b$, $Krb=Cr \cdot \alpha r \cdot \alpha g$,

$Kgr=Cg \cdot \alpha g \cdot \alpha b$, $Kgb=Cg \cdot \alpha g \cdot \alpha r$,

$Kbr=Cb \cdot \alpha b \cdot \alpha g$, $Kbg=Cb \cdot \alpha b \cdot \alpha r$,

$Kyg=Cy \cdot \alpha r \cdot \alpha b$, $Kmb=Cm \cdot \alpha r \cdot \alpha g$,

$Kmr=Cm \cdot \alpha b \cdot \alpha g$, $Kcg=Cc \cdot \alpha b \cdot \alpha r$,

$Kcb=Cc \cdot \alpha g \cdot \alpha r$, $Kyr=Cy \cdot \alpha g \cdot \alpha b$,

$\alpha r=f_0\times r^k$ $(0\leq r<Mr)$,

$\alpha r=f_1\times(1-r)^k$ $(Mr\leq r\leq 1)$,

$\alpha g=g_0\times gk$ $(0\leq g<Mg)$,

$\alpha g=g_1\times(1-g)^k$ $(Mg\leq g\leq 1)$,

$\alpha b=h_0\times b^k$ $(0\leq b<Mb)$,

$\alpha b=h_1\times(1-b)^k$ $(Mb\leq b\leq 1)$,

where f_0, f_1, g_0, g_1, h_0, h_1, Mr, Mg, Mb and k are constants; Cr, Cb, Cg, Cy, Cm and Cc are constants, and the r, g and b are obtained by dividing original gradation levels of the three color components of the input color image signal by a maximum gradation value N-1.

9. The color display device as set forth in claim 4, wherein:

the variables are expressed as:

$Krg=Cr\cdot\alpha r\cdot\alpha b$, $Krb=Cr\cdot\alpha r\cdot\alpha g$,

$Kgr=Cg\cdot\alpha g\cdot\alpha b$, $Kgb=Cg\cdot\alpha g\cdot\alpha r$,

$Kbr=Cb\cdot\alpha b\cdot\alpha g$, $Kbg=Cb\cdot\alpha b\cdot\alpha r$,

$Kyg=Cy\cdot\alpha r\cdot\alpha b$, $Kmb=Cm\cdot\alpha r\cdot\alpha g$,

$Kmr=Cm\cdot\alpha b\cdot\alpha g$, $Kcg=Cc\cdot\alpha b\cdot\alpha r$,

$Kcb=Cc\cdot\alpha g\cdot\alpha r$, $Kyr=Cy\cdot\alpha g\cdot\alpha b$,

$\alpha r=2\times r$ $(0\leq r<0.5)$,

$\alpha r=2\times(1-r)$ $(0.5\leq r\leq 1)$,

$\alpha g=2\times g$ $(0\leq g<0.5)$,

$\alpha g=2\times(1-g)$ $(0.5\leq g\leq 1)$,

$\alpha b=2\times b \quad (0\leq b<0.5)$,

$\alpha b=2\times(1-b) \quad (0.5\leq b\leq 1)$,

where Cr, Cb, Cg, Cy, Cm and Cc are constants, and the r, g and b are obtained by dividing original gradation levels of the three color components of the input color image signal by a maximum gradation value N-1.

10. The color display device as set forth in claim 4, wherein:

the variables are expressed as:

$Krg=Cr\cdot fmax\ (r)\cdot fmin\ (b)$, $Krb=Cr\cdot fmax\ (r)\cdot fmin\ (g)$,

$Kgr=Cg\cdot fmax\ (g)\cdot fmin\ (b)$, $Kgb=Cg\cdot fmax\ (g)\cdot fmin\ (r)$,

$Kbr=Cb\cdot fmax\ (b)\cdot fmin\ (g)$, $Kbg=Cb\cdot fmax\ (b)\cdot fmin\ (r)$,

$Kyg=Cy\cdot fmax\ (r)\cdot fmin\ (b)$, $Kmb=Cm\cdot fmax\ (r)\cdot fmin\ (g)$,

$Kmr=Cm\cdot fmax\ (b)\cdot fmin\ (g)$, $Kcg=Cc\cdot fmax\ (b)\cdot fmin\ (r)$,

$Kcb=Cc\cdot fmax\ (g)\cdot fmin\ (r)$, $Kyr=Cy\cdot fmax\ (g)\cdot fmin\ (b)$,

where Cr, Cb, Cg, Cy, Cm and Cc are constants; fmax, and fmin are functions which respectively change depending on values of r, g and b in corresponding brackets; and the r, g and b are obtained by dividing original gradation levels of the three color components of the input color image signal by a maximum gradation value N-1.

11. The color display device as set forth in claim 10, wherein:

the function fmax is a continuous function which gives 0 when the r, g and b ($0 \le r,g,b \le 1$) are 1; and the function fmin is continuous function which gives 0 when the r, g and b ($0 \le r,g,b \le 1$) are 0.

12. The color display device as set forth in claim 4, wherein:

the variables are expressed as:

$Krg=Cr \cdot Sr \cdot Tb$, $Krb=Cr \cdot Sr \cdot Tg$,

$Kgr=Cg \cdot Sg \cdot Tb$, $Kgb=Cg \cdot Sg \cdot Tr$,

$Kbr=Cb \cdot Sb \cdot Tg$, $Kbg=Cb \cdot Sb \cdot Tr$,

$Kyg=Cy \cdot Sr \cdot Tb$, $Kmb=Cm \cdot Sr \cdot Tg$,

$Kmr=Cm \cdot Sb \cdot Tg$, $Kcg=Cc \cdot Sb \cdot Tr$,

$Kcb=Cc \cdot Sg \cdot Tr$, $Kyr=Cy \cdot Sg \cdot Tb$,

$Tr=r^k$,

$Sr=(1-r)^k$,

$Tg=g^k$,

$Sg=(1-g)^k$,

$Tb=b^k$,

$Sb=(1-b)^k$,

where Cr, Cb, Cg, Cy, Cm, Cc and k are constants, and the r, g and b are obtained by dividing original gradation levels of the three color components of the input color image signal by a maximum gradation value N-1.

13. The color display device as set forth in claim 12, wherein:

the constant k is 1.

14. The color display device as set forth in claim 5, wherein:

the Cr, Cb, Cg, Cy, Cm and Cc are constants expressed as 1/(integer power of 2).

15. The color display device as set forth in claim 4, wherein:

the variables Nr and Ny are not less than 1.

16. The color display device as set forth in claim 4, wherein:

the variables Ng, Nb, Nm and Nc are not more than 1.

17. The color display device as set forth in claim 2, wherein:

the input color image signal is converted into an output color image signal with the three color components respectively having gradation levels of r', g' and b', which are given by:

$$\begin{pmatrix} r' \\ g' \\ b' \end{pmatrix} = \begin{pmatrix} r \\ g \\ b \end{pmatrix} + A_{36} \begin{pmatrix} ro \\ go \\ bo \\ yo \\ mo \\ co \end{pmatrix}$$

where r, g and b are values obtained by dividing original gradation levels of the three color components of the input color image signal by a maximum gradation value N-1; and A_{36} expresses square matrix of 3x6; and

in a case [1] where r≥g≥b:

$ro=Krg(r-g)^{Nr}$,

$yo=Kyg(g-b)^{Ny}$,

go=bo=mo=co=0,

in a case [2] where r≥b>g:

$ro=Krb(r-b)^{Nr}$,

$mo=Kmb(b-g)^{Nm}$,

go=bo=yo=co=0,

in a case [3] where b>r≥g:

$bo=Kbr(b-r)^{Nb}$,

$mo=Kmr(r-g)^{Nm}$,

ro=go=yo=co=0,

in a case [4] where b>g>r:

$bo=Kbg(b-g)^{Nb}$,

$co=Kcg(g-r)^{Nc}$,

ro=go=yo=mo=0,

in a case [5] where $g \geq b > r$:

$go = Kgb(g-b)^{Ng}$,

$co = Kcb(b-r)^{Nc}$,

$ro = bo = yo = mo = 0$,

in a case [6] where $g > r \geq b$:

$go = Kgr(g-r)^{Ng}$,

$yo = Kyr(r-b)^{Ny}$,

$ro = bo = mo = co = 0$,

in which Krg, Krb, Kbr, Kbg, Kgb, Kgr, Kyg, Kyr, Kmb, Kmr, Kcg and Kcb are variables which change depending on values of r, g and b; and Nr, Ng, Nb, Ny, Nm and Nc are constants not less than 0.

18. The color display device as set forth in claim 17, wherein:

the A_{36} is expressed as:

$$A_{36} = \begin{pmatrix} a11 & a12 & a13 & a14 & a15 & a16 \\ a21 & a22 & a23 & a24 & a25 & a26 \\ a31 & a32 & a33 & a34 & a35 & a36 \end{pmatrix}$$

where $a11=a22=a33=a14=a24=a15=a35=a26=a36=1$ and a21, a31, a12, a32, a13, a23, a34, a25 and a16 are 0 or a negative value.

19. The color display device as set forth in claim

17, wherein:

the A_{36} is expressed as:

$$A_{36} = \begin{pmatrix} a11 & a12 & a13 & a14 & a15 & a16 \\ a21 & a22 & a23 & a24 & a25 & a26 \\ a31 & a32 & a33 & a34 & a35 & a36 \end{pmatrix}$$

where a11=a22=a33=a14=a24=a15=a35=a26=a36=1, a11+a21+a31=0, a12+a22+a32=0, a13+a23+a33=0, a14+a24+a34=0, a15+a25+a35=0, and a16+a26+a36=0.

20. The color display device as set forth in claim 17, wherein:

the A_{36} is expressed as:

$$A_{36} = \begin{pmatrix} a11 & a12 & a13 & a14 & a15 & a16 \\ a21 & a22 & a23 & a24 & a25 & a26 \\ a31 & a32 & a33 & a34 & a35 & a36 \end{pmatrix}$$

where a11=a22=a33=a14=a24=a15=a35=a26=a36=1, a21=a31=a12=a32=a13=a23=-0.5, and a34=a25=a16=-2.

21. The color display device as set forth in claim 2, wherein:

the input color image signal is converted into an

output color image signal with the three color components respectively having gradation levels of r', g' and b', which are given by:

$$\begin{pmatrix} r' \\ g' \\ b' \end{pmatrix} = \begin{pmatrix} r \\ g \\ b \end{pmatrix} + A_{36} \begin{pmatrix} ro \\ go \\ bo \\ yo \\ mo \\ co \end{pmatrix}$$

where r, g and b are values obtained by dividing original gradation levels of the three color components of the input color image signal by a maximum gradation value N-1; and A_{36} expresses square matrix of 3x6; and

in a case [1] where r≥g≥b:

$ro=Krg(fzr(r)-fzg(g))^{Nr}$,

$yo=Kyg(fzg(g)-fzb(b))^{Ny}$,

go=bo=mo=co=0,

in a case [2] where r≥b>g:

$ro=Krb(fzr(r)-fzb(b))^{Nr}$,

$mo=Kmb(fzb(b)-fzg(g))^{Nm}$,

go=bo=yo=co=0,

in a case [3] where b>r≥g:

$bo=Kbr(fzb(b)-fzr(r))^{Nb}$,

$mo=Kmr(fzr(r)-fzg(g))^{Nm}$,

ro=go=yo=co=0,

in a case [4] where b>g>r:

$bo=Kbg(fzb(b)-fzg(g))^{Nb}$,

$co=Kcg(fzg(g)-fzr(r))^{Nc}$,

ro=go=yo=mo=0,

in a case [5] where g≥b>r:

$go=Kgb(fzg(g)-fzb(b))^{Ng}$,

$co=Kcb(fzb(b)-fzr(r))^{Nc}$,

ro=bo=yo=mo=0,

in a case [6] where g>r≥b:

$go=Kgr(fzg(g)-fzr(r))^{Ng}$,

$yo=Kyr(fzr(r)-fzb(b))^{Ny}$,

ro=bo=mo=co=0,

in which Krg, Krb, Kbr, Kbg, Kgb, Kgr, Kyg, Kyr, Kmb, Kmr, Kcg and Kcb are variables which change depending on values of r, g and b, Nr, Ng, Nb, Ny, Nm and Nc are constants not less than 0, and fzr, fzg, fzb are functions which respectively change depending on values of r, g and b in corresponding brackets.

22. The color display device as set forth in claim 21, wherein:

the functions fzr, fzg, fzb convert input values identical with each other into output values different from each other.

23. The color display device as set forth in claim 21, wherein:

the functions fzr, fzg, fzb satisfy $fzr=r^{2.2}$, $fzg=g^{2.2}$ and $fzb=b^{2.2}$.

24. The color display device as set forth in claim 21, wherein:

the functions fzr, fzg, fzb satisfy $fzr=r^2$, $fzg=g^2$ and $fzb=b^2$.

25. The color display device as set forth in claim 2, wherein:

the input color image signal is converted into an output color image signal with the three color components respectively having gradation levels of r', g' and b', which are given by:

$r'=r+ro+yo+mo$,

$g'=g+go+yo+co$,

$b'=b+bo+mo+co$,

where r, g and b are values obtained by dividing original gradation levels of the three color components of the input color image signal by a maximum gradation value N-1; and,

in a case [1] where $r \geq g \geq b$:

$ro=Krg \cdot fnr(r-g)$,

$yo=Kyg \cdot fny(g-b)$,

$go=bo=mo=co=0$,

in a case [2] where $r \geq b > g$:

$ro=Krb \cdot fnr(r-b)$,

$mo=Kmb \cdot fnm(b-g)$,

$go=bo=yo=co=0$,

in a case [3] where $b > r \geq g$:

$bo=Kbr \cdot fnb(b-r)$,

$mo=Kmr \cdot fnm(r-g)$,

$ro=go=yo=co=0$,

in a case [4] where $b > g > r$:

$bo=Kbg \cdot fnb(b-g)$,

$co=Kcg \cdot fnc(g-r)$,

$ro=go=yo=mo=0$,

in a case [5] where $g \geq b > r$:

$go=Kgb \cdot fng(g-b)$,

$co=Kcb \cdot fnc(b-r)$,

$ro=bo=yo=mo=0$,

in a case [6] where $g > r \geq b$:

$go=Kgr \cdot fng(g-r)$,

$yo=Kyr \cdot fny(r-b)$,

$ro=bo=mo=co=0$,

in which Krg, Krb, Kbr, Kbg, Kgb, Kgr, Kyg, Kyr, Kmb, Kmr, Kcg and Kcb are variables which change depending on values of r, g and b; and fnr(DX), fng(DX), fnb(DX), fny(DX),

fnm(DX) and fnc(DX) are functions which respectively change depending on calculation results DX ($0 \leq DX \leq 1$) of corresponding brackets.

26. The color display device as set forth in claim 25, wherein:

the functions fnr(DX) and fny(DX) each give a negative value at least at a predetermined value in a range of $0 < DX \leq 1$.

27. The color display device as set forth in claim 25, wherein:

the functions fnr(DX) and fny(DX) are expressed as:

$fnr(DX) = DX^2 - Pr \cdot DX$,

$fny(DX) = DX^2 - Py \cdot DX$,

where Pr and Py are constants greater than 0.

28. The color display device as set forth in claim 2, wherein:

the input color image signal is converted into an output color image signal with the three color components respectively having gradation levels of r', g' and b', which are given by:

$r' = r + ro + yo + mo$,

$g' = g + go + yo + co$,

$b'=b+bo+mo+co$,

where r, g and b are values obtained by dividing original gradation levels of the three color components of the input color image signal by a maximum gradation value N-1; and,

in a case [1] where $r \geq g \geq b$:

$ro=Cr(r-g)^{Nr}$,

$yo=Cy(g-b)^{Ny}$,

$go=bo=mo=co=0$,

in a case [2] where $r \geq b > g$:

$ro=Cb(r-b)^{Nr}$,

$mo=Cm(b-g)^{Nm}$,

$go=bo=yo=co=0$,

in a case [3] where $b > r \geq g$:

$bo=Cb(b-r)^{Nb}$,

$mo=Cm(r-g)^{Nm}$,

$ro=go=yo=co=0$,

in a case [4] where $b > g > r$:

$bo=Cb(b-g)^{Nb}$,

$co=Cc(g-r)^{Nc}$,

$ro=go=yo=mo=0$,

in a case [5] where $g \geq b > r$:

$go=Cg(g-b)^{Ng}$,

$co=Cc(b-r)^{Nc}$,

$ro=bo=yo=mo=0$, and

in a case [6] where $g>r\geq b$:

$go=Cg(g-r)^{Ng}$,

$yo=Cy(r-b)^{Ny}$,

$ro=bo=mo=co=0$,

in which Cr, Cg, Cb, Cy, Cm, Cc, Nr, Ng, Nb, Ny, Nm, and Nc are constants.

29. The color display device as set forth in claim 2, wherein:

the input color image signal is converted into an output color image signal with the three color components respectively having gradation levels of r', g' and b', which are given by:

$$\begin{pmatrix} r' \\ g' \\ b' \end{pmatrix} = \begin{pmatrix} r \\ g \\ b \end{pmatrix} + A_{36} \begin{pmatrix} ro \\ go \\ bo \\ yo \\ mo \\ co \end{pmatrix}$$

where r, g and b are values obtained by dividing original gradation levels of the three color components of the input color image signal by a maximum gradation value N-1; and A_{36} expresses square matrix of 3x6; and

in a case [1] where $r\geq g\geq b$:

$ro=Cr(r-g)$,

$yo=Cy(g-b)$,

go=bo=mo=co=0,

in a case [2] where [2]r≥b>g:

ro=Cr(r-b),

mo=Cm(b-g),

go=bo=yo=co=0,

in a case [3] where b>r≥g:

bo=Cb(b-r),

mo=Cm(r-g),

ro=go=yo=co=0,

in a case [4] where b>g>r:

bo=Cb(b-g),

co=Cc(g-r),

ro=go=yo=mo=0,

in a case [5] where g≥b>r:

go=Cg(g-b),

co=Cc(b-r),

ro=bo=yo=mo=0, and

in a case [6] where g>r≥b:

go=Cg(g-r),

yo=Cy(r-b),

ro=bo=mo=co=0,

in which Cr, Cg, Cb, Cy, Cm, and Cc are constants.

30. The color display device as set forth in claim 2, wherein:

the input color image signal is converted into an output color image signal with the three color components respectively having gradation levels of r', g' and b', which are given by:

r'=r+ro+yo+mo

g'=g+go+yo+co

b'=b+bo+mo+co

where r, g and b are values obtained by dividing original gradation levels of the three color components of the input color image signal by a maximum gradation value N-1; and,

in a case [1] where (r≥g≥b):

ro=Cr (fzr (r)-fzg (g)),

yo=Cy (fzg (g)-fzb (b)),

go=bo=mo=co=0,

in a case [2] where (r≥b>g):

ro=Cr (fzr (r)-fzb(b)),

mo=Cm (fzb (b)-fzg(g)),

go=bo=yo=co=0,

in a case [3] where (b>r≥g):

bo=Cb (fzb (b)-fzr(r)),

mo=Cm (fzr (r)-fzg(g)),

ro=go=yo=co=0,

in a case [4] where (b>g>r):

bo=Cb (fzb (b)-fzg(g)),

co=Cc (fzg (g)-fzr(r)),

ro=go=yo=mo=0,

in a case [5] where (g≥b>r):

go=Cg (fzg (g)-fzb(b)),

co=Cc (fzb (b)-fzr(r)),

ro=bo=yo=mo=0, and

in a case [6] where (g>r≥b):

go=Cg (fzg (g)-fzr(r)),

yo=Cy(fz r(r)-fzb(b)),

ro=bo=mo=co=0,

Where Cr, Cg, Cb, Cy, Cm and Cc are constants; and fzr, fzg and fzb are functions which change depending on the values of r, g and b in corresponding brackets.

31. The color display device as set forth in claim 2, wherein:

the input color image signal is converted into an output color image signal with the three color components respectively having gradation levels of r', g' and b', which are given by:

r'=r+ro+yo+mo

g'=g+go+yo+co

b'=b+bo+mo+co

where r, g and b are values obtained by dividing original gradation levels of the three color components of

the input color image signal by a maximum gradation value N-1; and,

ro=Cr·min (rg, rb),

go=Cg·min (gr, gb),

bo=Cb·min (br, bg),

yo=Cy·min (rb, gb),

mo=Cm·min (rg, bg),

co=Cc·min (gr, br),

in which min () is a function for giving a smallest value in a corresponding bracket; and Cr, Cg, Cb, Cy, Cm and Cc are constants,

on condition that:

rg=r-g,

rb=r-b,

gr=g-r,

gb=g-b,

br=b-r,

bg=b-g,

in which each of rg, rb, gr, gb, br and bg are modified to 0 when they are minus values.

32. The color display device as set forth in claim 2, wherein:

the input color image signal is converted into an output color image signal with the three color components

respectively having gradation levels of r', g' and b', which are given by:

$r'=r+ro+yo+mo$

$g'=g+go+yo+co$

$b'=b+bo+mo+co$

where r, g and b are values obtained by dividing original gradation levels of the three color components of the input color image signal by a maximum gradation value N-1; and

$ro=Krg \cdot rg$ where $rg<rb$,

$ro=Krb \cdot rb$ where $rg>rb$,

$go=Kgr \cdot gr$ where $gr<gb$,

$go=Kgb \cdot gb$ where $gr>gb$,

$bo=Kbr \cdot br$ where $br<bg$,

$bo=Kbg \cdot bg$ where $br>bg$,

$yo=Kyr \cdot rb$ where $rb<gb$,

$yo=Kyg \cdot gb$ where $rb>gb$,

$mo=Kmr \cdot rg$ where $rg<bg$,

$mo=Kmb \cdot bg$ where $rg>bg$,

$co=Kcg \cdot gr$ where $gr<br$,

$co=Kcb \cdot br$ where $gr>br$,

in which Krg, Krb, Kbr, Kbg, Kgb, Kgr, Kyg, Kyr, Kmb, Kmr, Kcg and Kcb are variables which change depending on values of r, g and b,

on condition that:

rg=r-g,

rb=r-b,

gr=g-r,

gb=g-b,

br=b-r,

bg=b-g,

in which each of rg, rb, gr, gb, br and bg are modified to 0 when they are minus values.

33. A color compensation method, comprising the steps of:

a) determining a relationship between plural color components of an input color image signal in terms of gradation levels of the plural color components of the input color image signal; and

b) carrying out calculation based on the relationship for each of the plural color components excluding a component with a relatively smallest gradation level, using variables varying depending on the respective gradation levels of the plural color components.

34. A color compensation method, comprising the steps of:

a) determining a relationship between three color components of an input color image signal in terms of

gradation levels of the three color components of the input color image signal; and

b) carrying out a different calculation for each input color image signal depending on which of six patterns of the relationship that the input color image signal belongs to,

wherein:

the calculation in the step (b) is carried out individually for each of the three color components excluding a component with a relatively smallest gradation level, using variables varying depending on the respective gradation levels of the three color components.

35. A color compensation program for causing a computer to execute the steps of:

a) determining a relationship between plural color components of an input color image signal in terms of gradation levels of the plural color components of the input color image signal; and

b) carrying out calculation based on the relationship for each of the plural color components excluding a component with a relatively smallest gradation level, using variables varying depending on the respective gradation levels of the plural color components.

36. A color compensation program for causing a

computer to execute the steps of:

a) determining a relationship between three color components of an input color image signal in terms of gradation levels of the three color components of the input color image signal; and

b) carrying out a calculation for each input color image signal depending on which of six patterns of the relationship that the input color image signal belongs to, the calculation being carried out individually for each of the three color components excluding a component with a relatively smallest gradation level, using variables varying depending on the respective gradation levels of the three color components.

37. A storage medium readable by a computer and storing a color compensation program for causing a computer to execute the steps of:

a) determining a relationship between plural color components of an input color image signal in terms of gradation levels of the plural color components of the input color image signal; and

b) carrying out calculation based on the relationship for each of the plural color components excluding a component with a relatively smallest gradation level, using variables varying depending on the respective gradation

levels of the plural color components.

38. A storage medium readable by a computer and storing a color compensation program for causing a computer to execute the steps of:

a) determining a relationship between three color components of an input color image signal in terms of gradation levels of the three color components of the input color image signal; and

b) carrying out a calculation for each input color image signal depending on which of six patterns of the relationship that the input color image signal belongs to, the calculation being carried out individually for each of the three color components excluding a component with a relatively smallest gradation level, using variables varying depending on the respective gradation levels of the three color components.

39. A color display device that determines a relationship between plural color components of an input color image signal in terms of gradation levels of the plural color components of the input color image signal, and that carries out calculation based on the relationship, the calculation performing multiplication of each of 1) RGB adjustment components, 2) YMC components as

complementary colors of the RGB components and 3) white component, extracted from the plural color components of the input color image signal, by a coefficient, and performing at least one of addition and subtraction of results of the multiplication to the plural color components.

40. A color display device that determines a relationship between three color components of an input color image signal in terms of gradation levels of the three color components of an input color image signal, and that carries out a different calculation for each input color image signal depending on which of six patterns of the relationship that the input color image signal belongs to, the calculation performing multiplication of each of 1) RGB adjustment components, 2) YMC components as complementary colors of the RGB components and 3) white component, extracted from the three color components of the input color image signal, by a coefficient, and performing at least one of addition and subtraction of results of the multiplication to the three color components.

41. The color display device as set forth in claim 39, wherein:

the color display device carries out the calculation

individually for each of the three color components excluding a component with a smallest gradation level, using variables that vary depending on the respective gradation levels of the three color components.

42. The color display device as set forth in claim 39, wherein:

the color display device compensates white color by using a coefficient which gives a positive value when the white component of the input color image signal has high luminance and gives a negative value when the white component of the input color image signal has low luminance.

43. The color display device as set forth in claim 39, wherein:

the input color image signal is converted into an output color image signal with the three color components respectively having gradation levels of r', g' and b', which are given by:

$r'=r+ro+yo+mo+wo$,

$g'=g+go+yo+co+wo$,

$b'=b+bo+mo+co+wo$,

where r, g and b are values obtained by dividing original gradation levels of the three color components of

the input color image signal by a maximum gradation value N-1; and,

in a case [1] where $r \geq g \geq b$,

$ro=Krg(r-g)^{Nr}$,

$yo=Kyg(g-b)^{Ny}$,

$wo=fw(b)$,

$go=bo=mo=co=0$,

in a case [2] where $r \geq b > g$,

$ro=Krb(r-b)^{Nr}$,

$mo=Kmb(b-g)^{Nm}$,

$wo=fw(g)$,

$go=bo=yo=co=0$,

in a case [3] where $b > r \geq g$,

$bo=Kbr(b-r)^{Nb}$,

$mo=Kmr(r-g)^{Nm}$,

$wo=fw(g)$,

$ro=go=yo=co=0$,

in a case [4] where $b > g > r$,

$bo=Kbg(b-g)^{Nb}$,

$co=Kcg(g-r)^{Nc}$,

$wo=fw(r)$,

$ro=go=yo=mo=0$,

in a case [5] where $g \geq b > r$,

$go=Kgb(g-b)^{Ng}$,

$co=Kcb(b-r)^{Nc}$,

wo=fw(r),

ro=bo=yo=mo=0,

in a case [6] where g>r≥b,

$go=Kgr(g-r)^{Ng}$,

$yo=Kyr(r-b)^{Ny}$,

wo=fw(b),

ro=bo=mo=co=0,

in which Krg, Krb, Kbr, Kbg, Kgb, Kgr, Kyg, Kyr, Kmb, Kmr, Kcg, Kcb and kw are either constants, or variables changing depending on values of r, g and b; Nr, Ng and Nr are constants not less than 0, and fw is a function which changes depending on the values of r, g and b in the corresponding bracket.

44. The color display device as set forth in claim 43, wherein:

the variables are expressed as:

$Krg=Cr\cdot\alpha r\cdot\alpha b$, $Krb=Cr\cdot\alpha r\cdot\alpha g$,

$Kgr=Cg\cdot\alpha g\cdot\alpha b$, $Kgb=Cg\cdot\alpha g\cdot\alpha r$,

$Kbr=Cb\cdot\alpha b\cdot\alpha g$, $Kbg=Cb\cdot\alpha b\cdot\alpha r$,

$Kyg=Cy\cdot\alpha r\cdot\alpha b$, $Kmb=Cm\cdot\alpha r\cdot\alpha g$,

$Kmr=Cm\cdot\alpha b\cdot\alpha g$, $Kcg=Cc\cdot\alpha b\cdot\alpha r$,

$Kcb=Cc\cdot\alpha g\cdot\alpha r$, $Kyr=Cy\cdot\alpha g\cdot\alpha b$,

$\alpha r=f_0\times r^k$ $(0\le r<Mr)$,

$\alpha r=f_1\times(1-r)^k$ $(Mr\le r\le 1)$,

$\alpha g=g_0\times g^k$ $(0\leq g<Mg)$,

$\alpha g=g_1\times(1-g)^k$ $(Mg\leq g\leq 1)$,

$\alpha b=h_0\times b^k$ $(0\leq b<Mb)$,

$\alpha b=h_1\times(1-b)^k$ $(Mb\leq b\leq 1)$,

where Cr, Cb, Cg, Cy, Cm and Cc are constants, and the r, g and b are obtained by dividing original gradation levels of the three color components of the input color image signal by a maximum gradation value N-1.

45. The color display device as set forth in claim 43, wherein:

the variables are expressed as:

$Krg=Cr\cdot\alpha r\cdot\alpha b$, $Krb=Cr\cdot\alpha r\cdot\alpha g$,

$Kgr=Cg\cdot\alpha g\cdot\alpha b$, $Kgb=Cg\cdot\alpha g\cdot\alpha r$,

$Kbr=Cb\cdot\alpha b\cdot\alpha g$, $Kbg=Cb\cdot\alpha b\cdot\alpha r$,

$Kyg=Cy\cdot\alpha r\cdot\alpha b$, $Kmb=Cm\cdot\alpha r\cdot\alpha g$,

$Kmr=Cm\cdot\alpha b\cdot\alpha g$, $Kcg=Cc\cdot\alpha b\cdot\alpha r$,

$Kcb=Cc\cdot\alpha g\cdot\alpha r$, $Kyr=Cy\cdot\alpha g\cdot\alpha b$,

$\alpha r=2\times r$ $(0\leq r<0.5)$,

$\alpha r=2\times(1-r)$ $(0.5\leq r\leq 1)$,

$\alpha g=2\times g$ $(0\leq g<0.5)$,

$\alpha g=2\times(1-g)$ $(0.5\leq g\leq 1)$,

$\alpha b=2\times b$ $(0\leq b<0.5)$,

$\alpha b=2\times(1-b)$ $(0.5\leq b\leq 1)$,

where Cr, Cb, Cg, Cy, Cm and Cc are constants, and

r, g and b are obtained by dividing the original gradation levels of the R, G and B components of the input image signal by the maximum gradation value N-1.

46. The color display device as set forth in claim 43, wherein:

the variables are expressed as:

$Krg=Cr \cdot Sr \cdot Tb$, $Krb=Cr \cdot Sr \cdot Tg$,

$Kgr=Cg \cdot Sg \cdot Tb$, $Kgb=Cg \cdot Sg \cdot Tr$,

$Kbr=Cb \cdot Sb \cdot Tg$, $Kbg=Cb \cdot Sb \cdot Tr$,

$Kyg=Cy \cdot Sr \cdot Tb$, $Kmb=Cm \cdot Sr \cdot Tg$,

$Kmr=Cm \cdot Sb \cdot Tg$, $Kcg=Cc \cdot Sb \cdot Tr$,

$Kcb=Cc \cdot Sg \cdot Tr$, $Kyr=Cy \cdot Sg \cdot Tb$,

$Tr=r^k$,

$Sr=(1-r)^k$,

$Tg=g^k$,

$Sg=(1-g)^k$,

$Tb=b^k$,

$Sb=(1-b)^k$,

where Cr, Cb, Cg, Cy, Cm, Cc and k are constants, and r, g and b are obtained by dividing the original gradation levels of the R, G and B components of the input image signal by the maximum gradation value N-1.

47. The color display device as set forth in claim

46, wherein:

the constant k is 1.

48. The color display device as set forth in claim 43, wherein:

the function fw changes depending on an average luminance and a peak luminance of a whole image.

49. The color display device as set forth in claim 43, wherein:

the function fw satisfies: $fw(X)=CwX^{Z}$,

where Cw and Z are constants, and X is one of the r, g and b.

50. The color display device as set forth in claim 43, wherein:

the function fw are expressed as:

$fw(X)=Cw_0X \quad (0 \leq X < Mw)$,

$fw(X)=Cw_1(1-X) \quad (Mw \leq X \leq 1)$,

where Cw_0, Cw_1, Mw are constants.

51. The color display device as set forth in claim 39, wherein:

the input color image signal is converted into an output color image signal with the three color components

respectively having gradation levels of r', g' and b', which are given by:

r'=r+ro+yo+mo+wo

g'=g+go+yo+co+wo

b'=b+bo+mo+co+wo

where r, g and b are values obtained by dividing original gradation levels of the three color components of the input color image signal by a maximum gradation value N-1; and

in a case [1] where (r≥g≥b):

ro=Cr(r-g),

yo=Cy(g-b),

wo=fw(b),

go=bo=mo=co=0,

in a case [2] where (r≥b>g):

ro=Cr(r-b),

mo=Cm(b-g),

wo=fw(g),

go=bo=yo=co=0,

in a case [3] where (b>r≥g):

bo=Cb(b-r),

mo=Cm(r-g),

wo=fw(g),

ro=go=yo=co=0,

in a case [4] where (b>g>r):

bo=Cb(b-g),

co=Cc(g-r),

wo=fw(r),

ro=go=yo=mo=0,

in a case [5] where (g≥b>r):

go=Cg(g-b),

co=Cc(b-r),

wo=fw(r),

ro=bo=yo=mo=0, and

in a case [6] where (g>r≥b):

go=Cg(g-r),

yo=Cy(r-b),

wo=fw(b),

ro=bo=mo=co=0,

in which Cr, Cg, Cb, Cy, Cm, and Cc are constants; and fw is a function dynamically changes depending on an average luminance and a peak luminance of a whole image.

52. The color display device as set forth in claim 39, wherein:

the input color image signal is converted into an output color image signal with the three color components respectively having gradation levels of r', g' and b', which are given by:

r'=r+ro+yo+mo+wo

$g'=g+go+yo+co+wo$

$b'=b+bo+mo+co+wo$

where r, g and b are values obtained by dividing original gradation levels of the three color components of the input color image signal by a maximum gradation value N-1; and,

$ro=Cr\cdot\min(rg, rb)$,

$go=Cg\cdot\min(gr, gb)$,

$bo=Cb\cdot\min(br, bg)$,

$yo=Cy\cdot\min(rb, gb)$,

$mo=Cm\cdot\min(rg, bg)$,

$co=Cc\cdot\min(gr, br)$,

$wo=fw\cdot\min(r, g, b)$,

in which min () is a function for giving a smallest value in a corresponding bracket,

on condition that:

$rg=r-g$,

$rb=r-b$,

$gr=g-r$,

$gb=g-b$,

$br=b-r$,

$bg=b-g$,

in which each of rg, rb, gr, gb, br and bg are modified to 0 when they are minus values.

53. The color display device as set forth in claim 39, wherein:

the input color image signal is converted into an output color image signal with the three color components respectively having gradation levels of r', g' and b', which are given by:

r'=r+ro+yo+mo+wo

g'=g+go+yo+co+wo

b'=b+bo+mo+co+wo

where r, g and b are values obtained by dividing original gradation levels of the three color components of the input color image signal by a maximum gradation value N-1; and

ro=Krg·rg where rg<rb,

ro=Krb·rb where rg>rb,

go=Kgr·gr where gr<gb,

go=Kgb·gb where gr>gb,

bo=Kbr·br where br<bg,

bo=Kbg·bg where br>bg,

yo=Kyr·rb where rb<gb,

yo=Kyg·gb where rb>gb,

mo=Kmr·rg where rg<bg,

mo=Kmb·bg where rg>bg,

co=Kcg·gr where gr<br,

co=Kcb·br where gr>br,

wo=fw (min (r, g, b)),

in which min () is a function for giving a smallest value in a corresponding bracket; Krg, Krb, Kbr, Kbg, Kgb, Kgr, Kyg, Kyr, Kmb, Kmr, Kcg and Kcb are variables which change depending on values of r, g and b; and fw is a function which changes depending on a value in a corresponding bracket,

on condition that:

rg=r-g,

rb=r-b,

gr=g-r,

gb=g-b,

br=b-r,

bg=b-g,

in which each of rg, rb, gr, gb, br and bg are modified to 0 when they are minus values.

54. A color compensation method, comprising the steps of:

a) determining a relationship between plural color components of an input color image signal in terms of their gradation levels; and

b) carrying out calculation based on the relationship, the calculation performing multiplication of each of 1) RGB adjustment components, 2) YMC components as

complementary colors of the RGB components and 3) white component, that have been extracted from the plural color components of the input color image signal, by a coefficient, and performing at least one of addition and subtraction of results of the multiplication to the plural color components.

55. A color compensation method, comprising the steps of:

a) determining a relationship between three color components of an input color image signal in terms of their gradation levels; and

b) carrying out a different calculation for each input color image signal depending on whether the input color image signal belongs to which of six patterns of the relationship,

wherein the calculation in the step (b) performs multiplication of each of 1) RGB adjustment components, 2) YMC components as complementary colors of RGB components and 3) white component, that have been extracted from the three color components of the input color image signal, by a coefficient, and performs at least one of addition and subtraction of results of the multiplication to the three color components.

56. A color compensation program for causing a

computer to execute the steps of:

a) determining a relationship between plural color components of an input color image signal in terms of their gradation levels; and

b) carrying out calculation based on the relationship, the calculation performing multiplication of each of 1) RGB adjustment components, 2) YMC components as complementary colors of the RGB components and 3) white component, that have been extracted from the plural color components of the input color image signal, by a coefficient, and performing at least one of addition and subtraction of results of the multiplication to the plural color components.

57. A color compensation program for causing a computer to execute the steps of:

a) determining a relationship between three color components of an input color image signal in terms of their gradation levels; and

b) carrying out a different calculation for each input color image signal depending on whether the input color image signal belongs to which of six patterns of the relationship, the calculation performing multiplication of each of 1) RGB adjustment components, 2) YMC components as complementary colors of the RGB components and 3) white component, that have been

extracted from the three color components of the input color image signal, by a coefficient, and performing at least one of addition and subtraction of results of the multiplication to the three color components.

58. A storage medium readable by a computer and storing a color compensation program for causing a computer to execute the steps of:

a) determining a relationship between plural color components of an input color image signal in terms of their gradation levels; and

b) carrying out calculation based on the relationship, the calculation performing multiplication of each of 1) RGB adjustment components, 2) YMC components as complementary colors of the RGB components and 3) white component, that have been extracted from the plural color components of the input color image signal, by a coefficient, and performing at least one of addition and subtraction of results of the multiplication to the plural color components.

59. A storage medium readable by a computer and storing a color compensation program for causing a computer to execute the steps of:

a) determining a relationship between three color components of an input color image signal in terms of their

gradation levels; and

b) carrying out a different calculation for each input color image signal depending on whether the input color image signal belongs to which of six patterns of the relationship, the calculation performing multiplication of each of 1) RGB adjustment components, 2) YMC components as complementary colors of the RGB components and 3) white component, that have been extracted from the three color components of the input color image signal, by a coefficient, and performing at least one of addition and subtraction of results of the multiplication to the three color components.

60. The color display device as set forth in claim 4, further comprising:

detecting means for detecting environmental changes; and

color converting means for controlling at least one of the coefficients Nr, Ng, Nb, Ny, Nm, Nc, Cr, Cg, Cb, Cy, Cm, Cc, Pr, Py and a factor of A_{36}, and the functions fzr, fzg, fzb, fw, fnr, fng, fnb, fny, fnm and fnc, according to a result of detection by the detecting means.

61. The color display device as set forth in claim 60, wherein:

the detecting means detects light intensity of outside of the color display device.

62. The color display device as set forth in claim 4, further comprising:

color converting means for controlling at least one of the coefficients Nr, Ng, Nb, Ny, Nm, Nc, Cr, Cg, Cb, Cy, Cm, Cc, Pr, Py and a factor of A_{36}, and the functions fzr, fzg, fzb, fw, fnr, fng, fnb, fny, fnm and fnc, depending on whether a backlight of a semi-transmission liquid crystal panel is on or off.

63. A color display device, comprising:

means for determining a relationship between plural color components of an input color image signal in terms of the gradation levels of the plural color components of the input color image signal; and

means for carrying out calculation based on the relationship for each of the plural color components excluding a component with a relatively smallest gradation level, using variables varying depending on respective gradation levels of the plural color components.

64. The color display device as set forth in claim 63, wherein:

the variables are determined so that gradation levels of the input color image signal after color compensation fall within a range of a color model that expresses the gradation levels of the input color image signal before and after color compensation in terms of distributions of hue, luminance and saturation.

65. A color display device, comprising:

means for determining a relationship between three color components of an input color image signal in terms of the gradation levels of the three color components of the input color image signal; and

means for carrying out a calculation for each input color image signal, the calculation being dependent upon which of six patterns of the relationship that the input color image signal belongs to, the calculation further being performed for each of the three color components excluding a component with a relatively smallest gradation level, using variables varying depending on respective gradation levels of the three color components.

66. A color display method, comprising:

determining a relationship between plural color components of an input color image signal in terms of the

gradation levels of the plural color components of the input color image signal; and

carrying out calculation based on the relationship for each of the plural color components excluding a component with a relatively smallest gradation level, using variables varying depending on respective gradation levels of the plural color components.

67. The color display method as set forth in claim 66, wherein:

the variables are determined so that gradation levels of the input color image signal after color compensation fall within a range of a color model that expresses the gradation levels of the input color image signal before and after color compensation in terms of distributions of hue, luminance and saturation.

68. The color display method as set forth in claim 66, wherein the color display method is for a television receiver.

69. A program, adapted to cause a computer to execute the method of claim 66.

70. A computer signal, comprising the program of

claim 69.

71. A computer readable medium, comprising the program of claim 69.

72. A color display method, comprising:

determining a relationship between three color components of an input color image signal in terms of the gradation levels of the three color components of the input color image signal; and

carrying out a calculation for each input color image signal, the calculation being dependent upon which of six patterns of the relationship that the input color image signal belongs to, the calculation further being performed for each of the three color components excluding a component with a relatively smallest gradation level, using variables varying depending on respective gradation levels of the three color components.

73. The color display method as set forth in claim 72, wherein the color display method is for a television receiver.

74. A program, adapted to cause a computer to execute the method of claim 72.

75. A computer signal, comprising the program of claim 74.

76. A computer readable medium, comprising the program of claim 74.

77. The color display device as set forth in claim 6, wherein:

the Cr, Cb, Cg, Cy, Cm and Cc are constants expressed as 1/(integer power of 2).

78. The color display device as set forth in claim 8, wherein:

the Cr, Cb, Cg, Cy, Cm and Cc are constants expressed as 1/(integer power of 2).

79. The color display device as set forth in claim 9, wherein:

the Cr, Cb, Cg, Cy, Cm and Cc are constants expressed as 1/(integer power of 2).

80. The color display device as set forth in claim 10, wherein:

the Cr, Cb, Cg, Cy, Cm and Cc are constants

expressed as 1/(integer power of 2).

81. The color display device as set forth in claim 12, wherein:

the Cr, Cb, Cg, Cy, Cm and Cc are constants expressed as 1/(integer power of 2).

82. A color display device, comprising:

means for determining a relationship between plural color components of an input color image signal in terms of gradation levels of the plural color components of the input color image signal; and

means for carrying out calculation based on the relationship, the calculation including multiplication of each of 1) RGB adjustment components, 2) YMC components as complementary colors of the RGB components and 3) white component, extracted from the plural color components of the input color image signal, by a coefficient, and including at least one of addition and subtraction of results of the multiplication to the plural color components.

83. A color display device, comprising:

means for determining a relationship between three

color components of an input color image signal in terms of gradation levels of the three color components of an input color image signal; and

means for carrying out a different calculation for each input color image signal depending on which of six patterns of the relationship that the input color image signal belongs to, the calculation including multiplication of each of 1) RGB adjustment components, 2) YMC components as complementary colors of the RGB components and 3) white component, extracted from the three color components of the input color image signal, by a coefficient, and including at least one of addition and subtraction of results of the multiplication to the three color components.

84. A color display method, comprising:

determining a relationship between plural color components of an input color image signal in terms of gradation levels of the plural color components of the input color image signal; and

carrying out calculation based on the relationship, the calculation including multiplication of each of 1) RGB adjustment components, 2) YMC components as complementary colors of the RGB components and 3) white component, extracted from the plural color components of

the input color image signal, by a coefficient, and including at least one of addition and subtraction of results of the multiplication to the plural color components.

85. The color display method as set forth in claim 84, wherein the color display method is for a television receiver.

86. A program, adapted to cause a computer to execute the method of claim 84.

87. A computer signal, comprising the program of claim 86.

88. A computer readable medium, comprising the program of claim 86.

89. A color display method, comprising:

determining a relationship between three color components of an input color image signal in terms of gradation levels of the three color components of an input color image signal; and

carrying out a different calculation for each input color image signal depending on which of six patterns of the relationship that the input color image signal belongs to,

the calculation including multiplication of each of 1) RGB adjustment components, 2) YMC components as complementary colors of the RGB components and 3) white component, extracted from the three color components of the input color image signal, by a coefficient, and including at least one of addition and subtraction of results of the multiplication to the three color components.

90. The color display method as set forth in claim 89, wherein the color display method is for a television receiver.

91. A program, adapted to cause a computer to execute the method of claim 89.

92. A computer signal, comprising the program of claim 91.

93. A computer readable medium, comprising the program of claim 91.

94. The color display device as set forth in claim 40, wherein:

the color display device compensates white color by using a coefficient which gives a positive value when the

white component of the input color image signal has high luminance and gives a negative value when the white component of the input color image signal has low luminance.

95. The color display device as set forth in claim 40, wherein:

the color display device carries out the calculation individually for each of the three color components excluding a component with a smallest gradation level, using variables that vary depending on the respective gradation levels of the three color components.

96. The color display device as set forth in claim 17, further comprising:

detecting means for detecting environmental changes; and

color converting means for controlling at least one of the coefficients Nr, Ng, Nb, Ny, Nm, Nc, Cr, Cg, Cb, Cy, Cm, Cc, Pr, Py and a factor of A_{36}, and the functions fzr, fzg, fzb, fw, fnr, fng, fnb, fny, fnm and fnc, according to a result of detection by the detecting means.

97. The color display device as set forth in claim 21, further comprising:

detecting means for detecting environmental changes; and

color converting means for controlling at least one of the coefficients Nr, Ng, Nb, Ny, Nm, Nc, Cr, Cg, Cb, Cy, Cm, Cc, Pr, Py and a factor of A_{36}, and the functions fzr, fzg, fzb, fw, fnr, fng, fnb, fny, fnm and fnc, according to a result of detection by the detecting means.

98. The color display device as set forth in claim 25, further comprising:

detecting means for detecting environmental changes; and

color converting means for controlling at least one of the coefficients Nr, Ng, Nb, Ny, Nm, Nc, Cr, Cg, Cb, Cy, Cm, Cc, Pr, Py and a factor of A_{36}, and the functions fzr, fzg, fzb, fw, fnr, fng, fnb, fny, fnm and fnc, according to a result of detection by the detecting means.

99. The color display device as set forth in claim 28, further comprising:

detecting means for detecting environmental changes; and

color converting means for controlling at least one of the coefficients Nr, Ng, Nb, Ny, Nm, Nc, Cr, Cg, Cb, Cy, Cm, Cc, Pr, Py and a factor of A_{36}, and the functions fzr, fzg, fzb,

fw, fnr, fng, fnb, fny, fnm and fnc, according to a result of detection by the detecting means.

100. The color display device as set forth in claim 29, further comprising:

detecting means for detecting environmental changes; and

color converting means for controlling at least one of the coefficients Nr, Ng, Nb, Ny, Nm, Nc, Cr, Cg, Cb, Cy, Cm, Cc, Pr, Py and a factor of A_{36}, and the functions fzr, fzg, fzb, fw, fnr, fng, fnb, fny, fnm and fnc, according to a result of detection by the detecting means.

101. The color display device as set forth in claim 30, further comprising:

detecting means for detecting environmental changes; and

color converting means for controlling at least one of the coefficients Nr, Ng, Nb, Ny, Nm, Nc, Cr, Cg, Cb, Cy, Cm, Cc, Pr, Py and a factor of A_{36}, and the functions fzr, fzg, fzb, fw, fnr, fng, fnb, fny, fnm and fnc, according to a result of detection by the detecting means.

102. The color display device as set forth in claim 31, further comprising:

detecting means for detecting environmental changes; and

color converting means for controlling at least one of the coefficients Nr, Ng, Nb, Ny, Nm, Nc, Cr, Cg, Cb, Cy, Cm, Cc, Pr, Py and a factor of A_{36}, and the functions fzr, fzg, fzb, fw, fnr, fng, fnb, fny, fnm and fnc, according to a result of detection by the detecting means.

103. The color display device as set forth in claim 43, further comprising:

detecting means for detecting environmental changes; and

color converting means for controlling at least one of the coefficients Nr, Ng, Nb, Ny, Nm, Nc, Cr, Cg, Cb, Cy, Cm, Cc, Pr, Py and a factor of A_{36}, and the functions fzr, fzg, fzb, fw, fnr, fng, fnb, fny, fnm and fnc, according to a result of detection by the detecting means.

104. The color display device as set forth in claim 17, further comprising:

color converting means for controlling at least one of the coefficients Nr, Ng, Nb, Ny, Nm, Nc, Cr, Cg, Cb, Cy, Cm, Cc, Pr, Py and a factor of A_{36}, and the functions fzr, fzg, fzb, fw, fnr, fng, fnb, fny, fnm and fnc, depending on whether a backlight of a semi-transmission liquid crystal panel is on

or off.

105. The color display device as set forth in claim 21, further comprising:

color converting means for controlling at least one of the coefficients Nr, Ng, Nb, Ny, Nm, Nc, Cr, Cg, Cb, Cy, Cm, Cc, Pr, Py and a factor of A_{36}, and the functions fzr, fzg, fzb, fw, fnr, fng, fnb, fny, fnm and fnc, depending on whether a backlight of a semi-transmission liquid crystal panel is on or off.

106. The color display device as set forth in claim 25, further comprising:

color converting means for controlling at least one of the coefficients Nr, Ng, Nb, Ny, Nm, Nc, Cr, Cg, Cb, Cy, Cm, Cc, Pr, Py and a factor of A_{36}, and the functions fzr, fzg, fzb, fw, fnr, fng, fnb, fny, fnm and fnc, depending on whether a backlight of a semi-transmission liquid crystal panel is on or off.

107. The color display device as set forth in claim 28, further comprising:

color converting means for controlling at least one of the coefficients Nr, Ng, Nb, Ny, Nm, Nc, Cr, Cg, Cb, Cy, Cm, Cc, Pr, Py and a factor of A_{36}, and the functions fzr, fzg, fzb,

fw, fnr, fng, fnb, fny, fnm and fnc, depending on whether a backlight of a semi-transmission liquid crystal panel is on or off.

108. The color display device as set forth in claim 29, further comprising:

color converting means for controlling at least one of the coefficients Nr, Ng, Nb, Ny, Nm, Nc, Cr, Cg, Cb, Cy, Cm, Cc, Pr, Py and a factor of A_{36}, and the functions fzr, fzg, fzb, fw, fnr, fng, fnb, fny, fnm and fnc, depending on whether a backlight of a semi-transmission liquid crystal panel is on or off.

109. The color display device as set forth in claim 30, further comprising:

color converting means for controlling at least one of the coefficients Nr, Ng, Nb, Ny, Nm, Nc, Cr, Cg, Cb, Cy, Cm, Cc, Pr, Py and a factor of A_{36}, and the functions fzr, fzg, fzb, fw, fnr, fng, fnb, fny, fnm and fnc, depending on whether a backlight of a semi-transmission liquid crystal panel is on or off.

110. The color display device as set forth in claim 31, further comprising:

color converting means for controlling at least one of

the coefficients Nr, Ng, Nb, Ny, Nm, Nc, Cr, Cg, Cb, Cy, Cm, Cc, Pr, Py and a factor of A_{36}, and the functions fzr, fzg, fzb, fw, fnr, fng, fnb, fny, fnm and fnc, depending on whether a backlight of a semi-transmission liquid crystal panel is on or off.

111. The color display device as set forth in claim 43, further comprising:

color converting means for controlling at least one of the coefficients Nr, Ng, Nb, Ny, Nm, Nc, Cr, Cg, Cb, Cy, Cm, Cc, Pr, Py and a factor of A_{36}, and the functions fzr, fzg, fzb, fw, fnr, fng, fnb, fny, fnm and fnc, depending on whether a backlight of a semi-transmission liquid crystal panel is on or off.

112. A color display method, comprising:

determining a relationship between plural color components of an input color image signal in terms of the gradation levels of the plural color components of the input color image signal; and

carrying out color compensation for flesh colored areas of the input color image signal, the color compensation varying non-linearly in comparison to color compensation carried out for the remainder of the image.

113. The color display method of claim 112, wherein color compensation for the remainder of the input color image signal is carried out from a calculation based on the relationship for each of the plural color components excluding a component with a relatively smallest gradation level, using variables varying depending on respective gradation levels of the plural color components.

114. The color display method as set forth in claim 113, wherein:

the variables are determined so that gradation levels of the input color image signal after color compensation fall within a range of a color model that expresses the gradation levels of the input color image signal before and after color compensation in terms of distributions of hue, luminance and saturation.

115. The color display method as set forth in claim 112, wherein the color display method is for a television receiver.

116. A program, adapted to cause a computer to execute the method of claim 112.

117. A computer signal, comprising the program of

claim 116.

118. A computer readable medium, comprising the program of claim 116.

119. A color display method, comprising:

determining a relationship between three color components of an input color image signal in terms of the gradation levels of the three color components of the input color image signal; and

carrying out color compensation for flesh colored areas of the input color image signal, the color compensation varying non-linearly in comparison to color compensation carried out for the remainder of the image.

120. The color display method of claim 119, wherein color compensation for the remainder of the input color image signal is carried out from a calculation for each input color image signal, the calculation being dependent upon which of six patterns of the relationship that the input color image signal belongs to, the calculation further being performed for each of the three color components excluding a component with a relatively smallest gradation level, using variables varying depending on respective gradation levels of the three color components.

121. The color display method as set forth in claim 119, wherein the color display method is for a television receiver.

122. A program, adapted to cause a computer to execute the method of claim 119.

123. A computer signal, comprising the program of claim 122.

124. A computer readable medium, comprising the program of claim 122.

125. A color compensation method, comprising the steps of:

a) determining a relationship between plural color components of an input color image signal in terms of gradation levels of the plural color components of the input color image signal; and

b) carrying out color compensation of the input color image signal by controlling a gamma characteristic based upon at least one of average luminance and peak luminance of the input color input signal.

126. The color display method of claim 125, wherein color compensation for the remainder of the input color image signal is carried out from a calculation for each input color image signal, the calculation being dependent upon which of six patterns of the relationship that the input color image signal belongs to, the calculation further being performed for each of the three color components excluding a component with a relatively smallest gradation level, using variables varying depending on respective gradation levels of the three color components.

127. The color display method as set forth in claim 125, wherein the color display method is for a television receiver.

128. A program, adapted to cause a computer to execute the method of claim 125.

129. A computer signal, comprising the program of claim 128.

130. A computer readable medium, comprising the program of claim 128.